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ABSTRACT

Since 1954 when Congress authorized the Copyright Office to prepare a series of studies to serve as background for revision hearings, copyright has been one of the major issues in librarianship. Although the impact that the New Copyright Law will have on interlibrary loan activity is yet to be determined, there is a need to know whether present library practices can be expected to comply with the new guidelines. This paper is the report on an attempt to apply the CONTU Guidelines of the proviso portion of Subsection 108(g)(2) to the interlibrary loan records for periodicals for 1976, 1977, and the first quarter of 1978 at a large special scientific library, the National Oceanic and Atmospheric Administration (NOAA) Library in Boulder, Colorado. For the three time periods in question, over 63 percent of requests were found to be for articles published within 10 years of the date of request, and more than 79 percent of requests involved five or fewer articles per periodical per year. Violations of the five copy limit amounted to 1.02 percent of requests in 1976 and 0.94 percent of requests in 1977; no violations were identified for the first quarter of 1978. Various graphs and tables of data are included. (Author)

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# THE EFFECT OF THE NEW COPYRIGHT LAW ON THE INTERLIBRARY LOAN ACTIVITY INVOLVING PERIODICALS: A Test of the (CONTU) Guidelines for Subsection 108 (g) (2) of the New Copyright Law to Determine Degree of Compliance and Establish a Basis from Which to Evaluate Current Periodical Interlibrary Loan Activity.

John Steuben

May 15, 1978

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

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INTRODUCTION

On October 19, 1976, the President signed the Copyright Revision Bill into law, Public Law 94-553. Since 1954 when Congress authorized the Copyright Office to prepare a series of studies to serve as background for revision hearings, copyright has been one of the major issues in librarianship (5). The new revision has not ended the controversy. It remains a key concern to all librarians. "Fair Use" has been one of the most controversial parts of the new law. How it came to be incorporated into copyright law can best be appreciated by examining the history of copyright.

The first written copyright law, enacted in England in 1710, was the Statute of Anne, "An Act for the Encouragement of Learning by Vesting Copies of Printed Books in the Author or Purchasers of Such Copies During the Times therin Mentioned." As a result of this law, the author as well as the publisher, was given the statutory right to his creation for a period of fourteen years with an additional renewal period of fourteen years (6).

The Statute of Anne had a marked influence in the American Colonies. On May 2, 1783, the Continental Congress recommended that the States enact measures to protect authors and publishers for a period of not less than fourteen years. During this period a group of American writers launched a copyright movement. Chief among these was Noah Webster. Largely because of his efforts twelve States

enacted copyright laws. While these laws were indeed a step forward, it became clear that more uniform protection was required. Toward that end, on September 5, 1787 at the Constitutional Convention in Philadelphia, David Brearly of New Jersey presented five proposals, the fifth of which proposed the creation of a Federal power protecting the works of author and inventors. With no recorded debate, this provision was accepted unanimously and became the eighth clause of Article I, Section 8 of the Constitution (6), (8). Three years later, in 1790 Congress passed the first United States Copyright Law, "An Act for the Encouragement of Learning by Securing the Copies of Maps, Charts, and Books to the Authors and Proprietors of such Copies during the Time Therin Mentioned." Protection was for an initial period of fourteen years with a renewal period of an additional fourteen years.

Several significant revisions to the law were made on these occasions:

1802--protection extended to designs, engravings and etchings.
1831--protection extended to musical compositions and the first term of copyright was extended to 28 years.
1856--performance rights were granted to dramatics.
1861--copyright cases could be appealed to the Supreme Court.
1865--protection was extended to photographs.
1870--protection was extended to paintings, statutes, chromes, models and designs.
1891--Chase Act extended protection to foreign authors, artists, etc. (6).

In 1905 and 1906, conferences were held in an attempt to revise the Copyright Law. After considerable debate

and revision, the New Copyright Law was passed in 1909. By this act, the term of copyright was set at 28 years with renewal for another 28 years.

While the original copyright law of 1790 has undergone several major revisions, it is the judicial decisions interpreting the Constitution and the Act that reflect the development of copyright in the United States (2). Of particular importance is the judicially conceived doctrine of "fair use", which is now given statutory recognition in the current law (Section 107. Limitations of Exclusive Rights: Fair Use). In Folsom vs. Marsh, 9 F. Cas. 342 (No. 4901)(C.C.d. Mass. 1841), Mr. Justice Story laid down the tests for what was later to be called "fair use", which are now incorporated in the new Copyright Law of 1976.

> "In short, we must often, in deciding questions of this sort, look to the nature and objects of the selections made, the quantity and value of the materials used, and the degree to which the use may prejudice the sale, or diminish the profits or supersede the objects of the original work." (2).

Although the courts have considered and ruled upon the fair use doctrine many times, no real definition of the concept has ever emerged. Since the doctrine is an equitable rule of reason, no generally applicable definition is possible, and each case raising the question must be

decided on its own facts (2),(7),(9). On the other hand, the courts have evolved a set of criteria which, though in no case definitive, provide some reference for application. These criteria have been stated variously, but essentially they can be reduced to the four standards which have been adopted in Section 107: "(1) the purpose and character of the use, including whether such use is of commercial nature or is for non-profit educational purposes; (2) the nature of the copyrighted work; (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and (4) the effect of the use upon the potential market for or value of the copyrighted work " (6).

These criteria are relevant in determining whether the basic doctrine of fair use, as stated in the first sentence of Section 107, applies in a given case: "Not withstanding the provisions of Section 106, the fair use of a copyrighted work, including such use by reproduction in copies or phonorecords, or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching(including multiple copies for classroom use),scholarship, or research, is not an infringement of copyright" (6).

The statement of the fair use doctrine is Section 107 offers some guidance to users in determining when the principles of the doctrine apply. However, the endless variety of situations and conbinations of circumstances that can arise in particular cases precludes formulation

of exact rules. In an effort to ensure that concerned parties arrive at a concensus concerning use of copyrighted material, Chairman Kastenmeier and other members of the Judiciary Subcommittee urged the parties to meet together independently. The result was a set of guidelines for use of copyrighted books and periodicals which specify and detail the conditions which constitute fair use. The 1977 Bowker Annual contains a copy of the text of these guidelines (7),(8).

Of particular importance in this project and to libraries in general is Section 108 (Reproduction by Libraries and Archives). Notwithstanding the exclusive rights of the owners of copyright, Section 108 provides that under certain circumstances it is not an infringement of copyright for a library or archives, or any of its employees acting within the scope of their employment, to reproduce or distribute not more than one copy or phonorecord of a work, provided (1) the reproduction or distribution is made without any purpose of direct or indirect commercial advantage, and (2) the collections of the library or archive are open to the public or available not only to researchers affiliated with the library or archives, but also to other persons doing research in a specialized field, and (3) the reproduction or distribution of the work includes a notice of copyright.

Subsection (g) provides that the rights granted by this section extend only to the "isolated and unrelated

reproduction of a single copy or phonorecord of the same material on separate occassions." However, this section does not authorize the related or concerted reproduction of multiple copies or phonrecords of the same material, whether made on one occassion or over a period of time, and whether intended for aggregate use by one individual or for separate use by the individual members of a group. With respect to material described in subsection (d), "articles or other contributions to periodicals or collections, and small parts of other copyrighted works", subsection (g)(2) provides that the exemptions of section 108 do not apply if the library or archive engages in"systematic reproduction or distribution of single or multiple copies or phonprecords. This provision provoked a storm of controversy, centering around the extent to which the restrictions on systematic activities would prevent the continuation and development of interlibrary networks and other arrangements involving the exchange of photocopies. After thorough consideration, the Committee amended Section 108 (g)(2) to add the following proviso:

> "Provided, that nothing in this clause prevents a library or archives from participating in interlibrary arrangements that do not have as their purpose or effect, that the library or archives receiving such copies or phonorecords for distribution does so in such aggregate quantities as to substitute for a subscription to or purchase of such work."

The key phrases in the Committee's amendment of Section 108 (g)(2) are "aggregate quantities" and "substitute for a subscription to or purchase of" a work.

The National Commission on New Technological Uses of Copyrighted Works (CONTU) offered to help define realistically, "such aggregate quantities". This commission considers the following guidelines to be workable and fair interpretation of the intent of the proviso portion of Subsection 108(g)(2). These guidelines are intended to provide guidance in application of Section 108 to the most frequently encountered interlibrary case, namely obtaining photocopies of fairly recent periodical articles instead of borrowing actual issues of the periodical. Recent being defined as within 5 years prior to the date of the request (3). As used in the proviso of Subsection 108(g)(2), the words "such aggregate quantities as to substitute for subscription to or purchase of such work" shall mean:

> "With respect to any given periodical (as opposed to any given issue of a periodical), filled requests of a library or archives (a "requesting entity") within any calendar year for a total of six or more copies of an article or articles published in such periodical within five years prior to the date of request. These guidelines specifically shall not apply, directly or indirectly to any request of a requesting entity for a copy or copies of an article or articles published in any issue of a periodical, the publication date of which is more than five years prior to the date when the request is made. These guidelines do not define the meaning, with respect to such a request, of ... such aggregate quantities as to substitute for a subscription to such periodical. No request for a copy or phonorecord of any material to which these guidelines apply may be fulfilled by the supplying entity unless such request is accompanied by a representation by the requesting entity that the request was made in conformity with these guidelines. The requesting entity shall maintain records of all requests made by it for copies or phonorecords of any material to which these guidelines apply and shall maintain

> records of the fulfillment of such requests, which records shall be retained until the end of the third complete calendar year after the end of the calendar year in which the requests shall have been made." (7),(8).

The impact that the new Copyright Law will have on interlibrary loan activity is yet to be determined. There is, however, a need to know whether present library practices can be expected to comply with the new regulations. This project is an attempt to apply the CONTU Guidelines quoted above to the interlibrary loan records for periodicals for 1976, 1977, and the first quarter of 1978 at a large special library, in order to identify violations of the 5 copy limit which would have occurred had these new guidelines been in effect in 1976 and 1977 and which have occurred to date in 1978. For the purposes of this study a periodical will be considered to be any serially numbered and issued publication which appears with at least annual frequency, and will include the published transactions, proceedings, and papers of conferences. This is the working definition used at the subject library, and has been adopted for that reason.

The subject library is the NOAA (National Oceanic and Atmosperic Administration) Library located at the Environmental Research Laboratories in Boulder, Colorado, (herein referred to as "the Library"). Boulder Laboratories maintains a technical Library as a service to its scientific staff in supporting the Laboratories' research programs. The Library is located in two places, the south wing at the entrance to the Radio Building (Room 1202) on Broadway

and Research Building 3 (Room 678) on the 30th Street Campus of the University of Colorado. The Library Staff obtains and makes available books, periodicals, government documents, unpublished papers of international meetings, and other pertinent bibliographical material in a number of languages. These materials cover the areas of atmospheric physics, cryogenics, earth sciences, mathematics, meteorology, physics, plasma and space physics and radio. The Library has collected more than 37,000 titles. The books are arranged and classified by the Library of Congress system. The master card catalog in the Main Library and the Branch card catalog in RB3, are the keys to the book collection. The Library subscribes to over 900 journals. Current journals are displayed and arranged in alphabetical order by title. In the Main Library, current awareness periodicals are displayed separately near the circulation desk. The Kardex and its published version, the Periodicals Index, are the keys to the periodicals holdings. There are over 14,000 bound volumes of journals. Technical reports are a significant part of the Library's holdings. There are more than 43,000 hard copy reports and 243,000 reports on microfiche located in the west section of the Library. A separate card catalog locates reports acquired through 1970. A computer printout indexes the report holdings acquired after 1970. Technical report indexes provide access to the microfiche collection. The Library subscribes to many of the indexing and abstracting services for scientific literature, and has access to over 100 on-line

bibliographic files through SDC and Lockheed, as well as to DOE RECON.

## METHODS

The interlibrary loan records of the NOAA Library are kept for a period of 5 years. Within each year's file, distinction is made, through the use of color-coded forms, between periodicals, technical reports, and monographs. The requests for each type of material are arranged alphabetically by title. Each year's records, therefore, is in three sections, each subarranged alphabetically by title. The records for periodical articles requested during 1976, 1977, and the first quarter of 1978, were examined and the title of the periodical and the date of publication of the particular issue were recorded for each request on a 3x8 inch slip of paper. Requests for the same periodical were then stapled together, counted, and the total number of requests recorded on the top slip. The resulting bundles were then sorted into groups according to number of requests. Tables 2,4,and 6 contain a list of the number of requests and the number of different periodicals in each group for each time period. A tally was made of the year of publication for each requested item for each period. These data are recorded in Tables 1, 3, and 5, and are presented in bar graphs in Figures 1, 2, and 3, respectively. Bar graphs were also made for the data in Tables 2, 4, and 6, and are represented in Figures 4, 5, and 6, respectively. The percentage of requests which were made for material (a)older than 10 years; (b) within 5 years; (c) within 10 years; (d) of single requests; (e) of 5 or fewer requests; and (f) average number of requests per periodical title were calculated and are represented in Table 7.

For the periodicals for which 6 or more requests had been made, and , therefore, for which the possibility of violation existed, a tally was made of the date of publication for each request to determine how many occurred within the period five years prior to the date of request. This information is recorded in Tables 8, 9, and 10. Table 11 contains the periodicals for which violations were found along with the number of violations for each. This table also contains the percentage that these violations constitute of the number of requests for that year, and the percentage of the number of periodicals involved for that year. Table 12 contains a list of all periodicals with more than 5 requests in the 3 time periods along with a designation of which year this occurred and whether any violations were found or the limit of allowable requests reached. This was done to identify any periodicals for which requests are chronically high, and for which violations may be expected in the future.

## EXPECTED RESULTS

Since it is the policy of the Library to identify and acquire as quickly as possible subscriptions to periodicals which are of current pertinence and value to the researchers at Boulder Laboratories, it seemed reasonable to assume that interlibrary loan requests would involve periodicals which only occasionally contain pertinent articles, or which involved articles more than 5 years old. If these periodicals were subsequently considered to be important information resources, the Library would begin subscribing to them, and thus eliminate the need for further interlibrary loan requests for photocopies from the recent issues. I, therefore, hypothesized that although some multiple requests which would now constitute violations of copyright guidelines would occur, that these would result in violations that constituted only a small part of the total requests for photocopies of articles, less than 2%. Furthermore, I hypothesized that if the Library were to acquire subscriptions to all periodicals for which violations had occurred, that is, to assume that this is the only option, when in fact there are many others, that the resulting expenditure would amount to less than 1% of the periodicals budget for that year based on current subscription prices. Based on Library policy, it seems probable that there would be minimal difficulty involved in complying with the guidelines of the New Copyright Law.

RESULTS

Perhaps the most striking feature of the data in Tables 1, 3, and 5 is the large number of requests made for material within 10 years prior to the date of request for each of the three time periods. The bar graphs of these data represented in Figures 1, 2, and 3, respectively, show this relationship quite clearly. In all three figures, a large part of the shaded area, which represents total number of requests, is under a single large peak far to the right along the axis which represents time in years. This area, representing the period 10 years prior to the year of request, equals 73.0% of total periodical requests for 1976, 63.8% of requests for 1977, and 71.8% of total periodical requests for the first quarter of 1978 (see Table 7).

An unusual feature which is also evident in each of Figures 1, 2, and 3 is the marked decrease in the number of requests for material published in the same year during which the requests were made. In each instance, the requests for material published in the same year during which the requests were made was at least 50% less than requests for materials one year old. For 1976, this decrease was 52%, for 1977 it was 64%, and for the first quarter of 1978 the decrease was 90%. As obvious as this markedly lower number of requests for the most recent material, is the fact that the greatest number of requests in 1976 and 1977 was for material published one year prior to the year in which the requests were made. So far in 1978 material two years old has been requested most often. In each case

requests for material one year old represented approximately 10% of the total requests for that period, 14% for 1976, 11% for 1977, and 9.8% for the first quarter of 1978.

The distribution of requests among periodicals is shown in Tables 2, 4, and 6, and in Figures 4, 5, and 6, respectively. It is readily apparent that most requests were single requests, that is a request for one copy of one article from one periodical for the period in question. For 1976 single requests constituted 48% of the requests for periodical articles for that year. For 1977 single requests amounted to 46.5% of all requests, and for the first quarter of 1978, 68.6% of the requests were single requests. The shaded area in Figures 4, 5, and 6 represents total number of requests for each period. These figures demonstrate clearly that the majority of requests involved 5 or fewer requests per periodical. In 1976, 91.6% of requests involved 5 or fewer requests per periodical. Requests for 1977 and the first quarter of 1978 in this category amounted to 79.4% and 95.6% of total requests, respectively. Correspondingly, requests of 6 or more per periodical amounted to 8.6% of total requests in 1976, 20.1% for 1977, and 4.4% for the first quarter of 1978.

Requests which would now be considered violations of the guidelines of the New Copyright Law are listed in Table 11. In 1976, one periodical from which 8 requests were in exdess of the 5 copy limit was found. These 8

requests constitute 1.02% of the total requests in 1976, and the periodical 0.2% of the total periodicals from which articles were requested. In 1977, 10 requests were in excess of the limit. These violations invloved 3 periodicals. This corresponds to 0.94% of total requests and 0.46% of the periodicals for the year. Interlibrary loan requests for periodical articles have not yet resulted in any violations of the guidelines for 1978, although requests have reached the limit of allowable request for 2 periodicals. These 10 requests constitute 3.2% of the total requests to date, and 0.8% of the total number of periodicals.

In 1976 the Geological Society of America Abstracts was the only periodical involved in any violations. The current subscription price for this periodical is $11.00 per year (prices taken from the 16th edition of Ulrich's International Periodicals Directory, and are probably less than actual current prices). The periodicals budget at the Library in 1976 was approximately $62,300. Acquiring this periodical would, therefore, have required an expenditure of 0.018% of the periodicals budget. Three periodicals involved violations in 1977; International Journal of Mass Spectrometry and Ion Physics, Electrochemical Society Journal, and Journal of Chromatography. The current subscription prices listed in Ulrich's are $123.75, $50.00, and$593.95, respectively. Acquiring subscriptions to these 3 publications would have cost $767.95 or 1.09% of that

year's $70,600 periodicals budget. No violations have occurred yet in 1978, but requests for articles from the Electrochemical Society Journal and Economic Geology have reached the 5 copy limit. Subscription prices from Ulrich's for these periodicals are currently $50.00 and $20.00 per year. Acquiring subscriptions would result in expenditures of 0.08% of this year's $84,700 budget.

## DISCUSSION

The results of this study appear to support the hypothesis. Requests which would now be considered violations of the Copyright guidelines constituted 1.02% of the requests made in 1976, and 0.94% of the requests made in 1977. Both of these figures are well below the expected 2%. No violations have occurred yet in 1978, although requests for 2 periodicals have reached the allowable limit. The periodicals involved in the would-be violations during 1976 and 1977 show a large range in subscription price, from $11 per year to $593.95 per year, a range of $582.95. The cost of acquiring these periodicals corresponds fairly well with the expected results. The periodical identified in 1976 would have required an expenditure of 0.018% of that year's periodical budget. The 3 periodicals identified in 1977, all much more expensive than the one identified in the previous year, would have required an expenditure equal to 1.09% of the 1977 periodicals budget, slightly more than the 1% expected. Viewed from this perspective, the impact of the New Copyright Law and guidelines would appear to be slight.

Analysis of the distribution of the requests among periodicals showed that single requests accounted for a large part of the total requests, 48% in 1976, 46.5% in 1977, and 68.6% for the first quarter of 1978. A study similar to this one, done at the National Bureau of Standards Library, Washington, D. C. in 1977 on the 1976

periodicals interlibrary loan data found that 66% of requests were single requests (10). This is 18% more than found at the NOAA Library for 1976. For this same period 13% of requests were for 6 or more per periodical at NBS, compared with 8.6% at NOAA. This indicates that more requests at the NOAA Library involved 2 to 5 requests per periodical than at NBS. In spite of the differences, the results of both studies show similarities, which suggest that at least in thesetwolibraries, single requests for periodicals costitute a similar large percentage of the total requests.

The number of requests of 6 or more per periodical amounted to 8.6% in 1976, 20.1% in 1977 and 4.4% in 1978. The actural number of periodical requests for each period were 67 in 1976, 215 in 1977, and 14 for the first quarter of 1978. At the rate of $10 per interlibrary loan request, (10) $130 was spent for the 13 requests for Geological Society of America Abstracts in 1976, $390 for the 39 requests for the three periodicals involved in violations in 1977, and $140 for the 14 requests for the periodicals for which the limits have been reached in 1978. In the 1976 and 1978 periods it would appear to have been more economical to subscribe to the periodicals in question. For 1977, because of the very high price of the Journal of Chromatography, the Library saved money by borrowing. On the average, it has been suggested that the break-even point is 6 requests, above this it is more economical to

subscribe to a periodical than to borrow it (10). Because of the wide variation in prices for scientific periodicals, this rule cannot be applied indiscriminately. Besides, subscription price is only a part of the cost of acquiring a periodical. Handling, storage, and binding costs are a significant part of the cost of any periodical. These vary according to number of issues per year, reliability of the dealer (claiming costs), binding decisions made, and availability of storage space. At the NOAA Library, shortage of storage space is particularly critical and would be an important consideration in deciding whether to subscribe to a particular periodical or to borrow it.

It would not make econimic sense to subscribe to a periodical based on one year's requests, if it was not needed again. Repeated multiple requests over several years would, however, serve to indicate a more permanent value and would be a surer basis upon which to decide to subscribe to any given periodical. This would necessarily apply to requests for recent articles, since older issues of a periodical will probably not be available except through interlibrary loan. Table 12 lists all periodicals for which more than 5 requests were made in any one time period along with a designation of which year this occurred and whether any violations occurred. Several periodicals fall into this category of repeated multiple requests. Based on only 2 years complete records, however, I would hesitate to make any recommendations for purchases. The one possible

exception is the Electrochemical Society Journal, which has already reached the limit in 1978 and was involved in violations in 1977. This would seem to indicate that the researchers at NOAA-ERL find this publications to be a valuable source for current articles of interest.

The results of this study suggets that the Library has been reasonably successful in meeting the needs of its patrons with respect to the periodical literature. Most requests involve fewer than 5 requests per periodical per year. If the interlibrary loan activity does not increase, the Library would be safe to continue on as it has in the past with few problems. Figure 7, however, shows quite clearly that the number of interlibrary loan requests for periodicals is on the increase. The increase between 1976 and 1977 was 289 requests. The projected number of requests for 1978 is 1260. If this is accurate, this means an increase of 190 over 1978 requests. Since the monthly interlibrary loan activity remains fairly constant, it is reasonable to expect that the 1260 requests for 1978 is an accurate estimate. As the number of interlibrary loan requests increase, the number of violations, or at least the problem of avoiding violations will increase. If the results of this study are in any way characteristic, then the increases in violation and number of periodicals involved in 1977 as compared with 1976 may be an indication of what can be expected in the future. Indeed,twoperiodicals have already reached the allowable limit for this year.

Another important factor to be considered is the impact of on-line literature retrieval on interlibrary loan activity. This capability may cause a further increase in interlibrary loan requests. This effect has been reported in the literature. In one case, the on-line retrieval capability resulted in a 50% increase in interlibrary loan requests, although the increase was not long lived (9). Since the NOAA Library recently launched a program to increase patron awareness of this service, which will hopefully result in increased use by the patrons, it is likely that there will be some impact on interlibrary loan activity. There is also the possibility that increased use of on-line retrieval may alter the distribution of the requests, that is increase requests for very recent material. This could be quite troublesome with respect to violations of the copyright guidelines. In the past requests were most numerous for material one year old (see Figures 1, 2, and 3). This may be due to the delay involved in citing related literature, which is one way researchers become aware of material not in the library. On-line retrieval may partially eliminate this delay by bringing this newly published material to the patron's attention sooner than would otherwise occur.

## RECOMMENDATIONS

Based on this investigation, one periodical, Electrochemical Society Journal, would appear to be involved in interlibrary loan requests for recent articles often enough to warrent subscribing to it. Even though the percentage of requests which would now involve violations, has been small in the recent past, the influence of on-line literature searching may alter the situation. Although there is some documentation of increased interlibrary loan activity as a result of the introduction of on-line literature searching, it remains to be seen if this capability will increase the number of violations of the copyright guidelines, or at least cause libraries increased difficulty in providing periodical articles within these guidelines (1). Since the effect of on-line retrieval is likely to be of interest in relation to interlibrary loan requests for periodicals, I have suggested that the library staff include information on each recorded request indicating whether or not the request was initiated as the result of an on-line literature search. This will provide data with which to establish the relationship between on-line retrieval and interlibrary loan requests.

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# APPENDIX OF

# TABLES

# AND

# FIGURES

**Figure 1. Distribution of Requests for 1976**

**Year of Publication vs Number of Requests.**

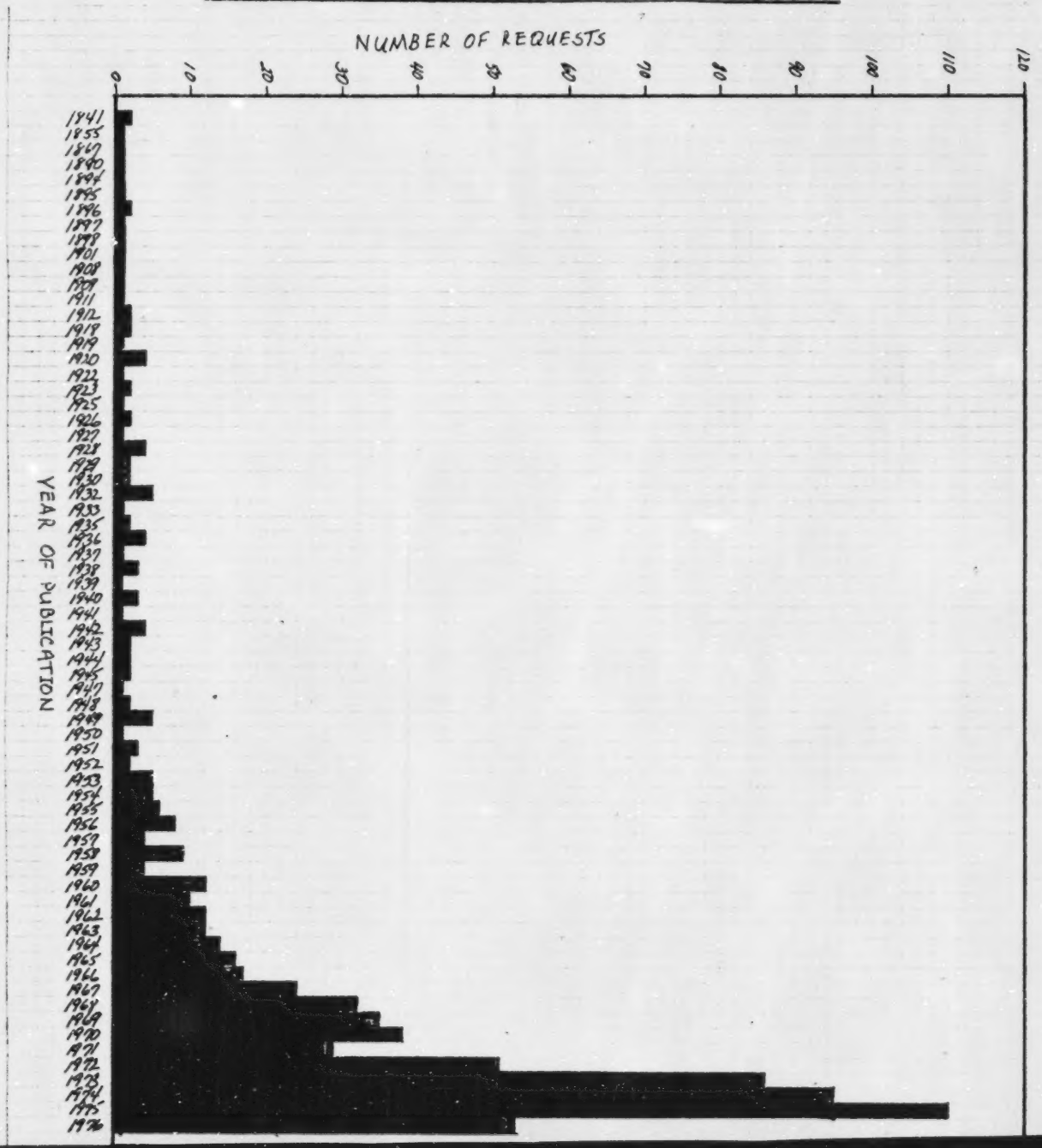


**Figure 2. Distribution of Requests for 1977**
**Year of Publication vs Number of Requests.**

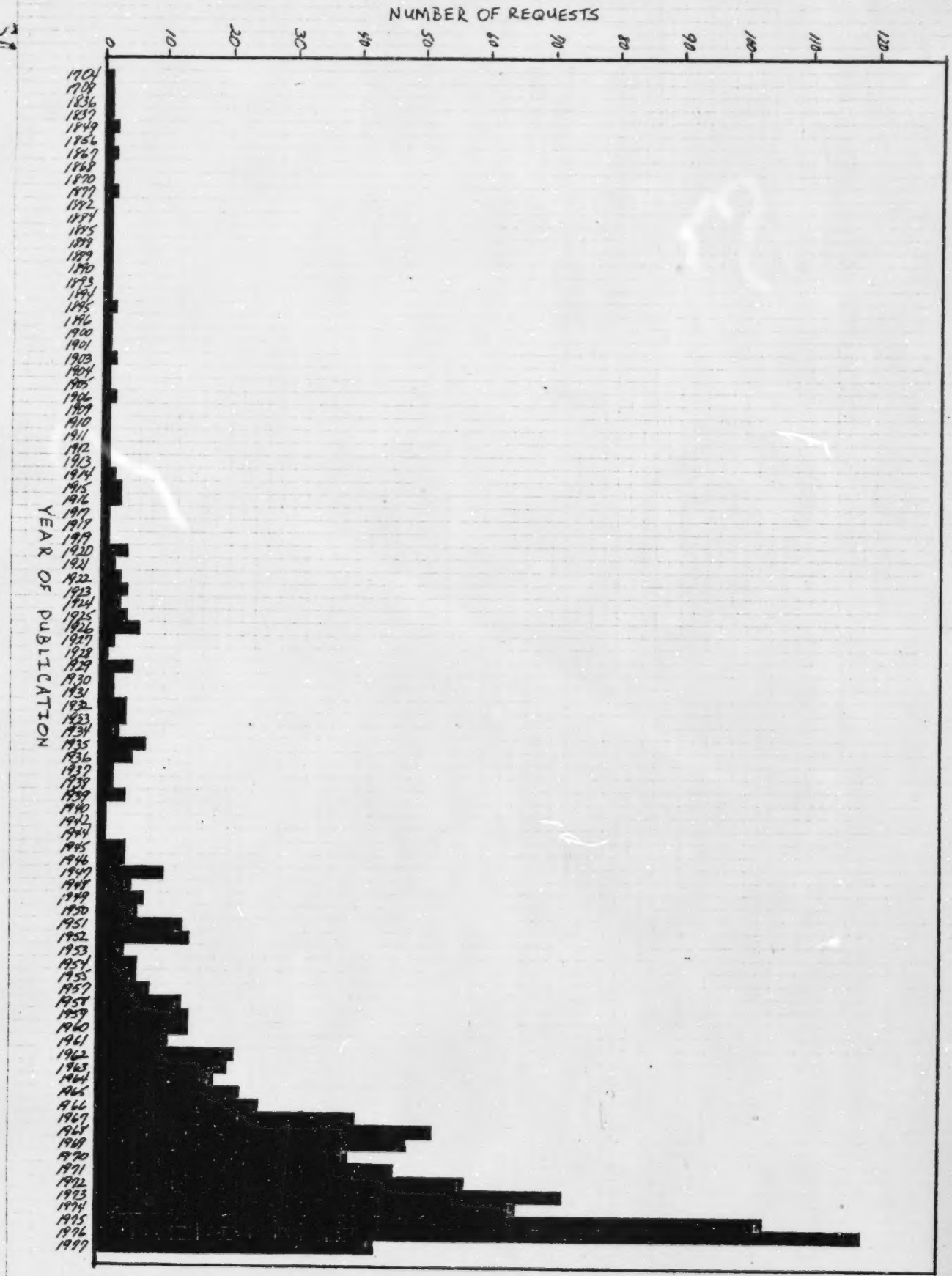


Figure 3. Distribution of Requests for First Quarter of 1978.
Year of Publication vs Number of Requests

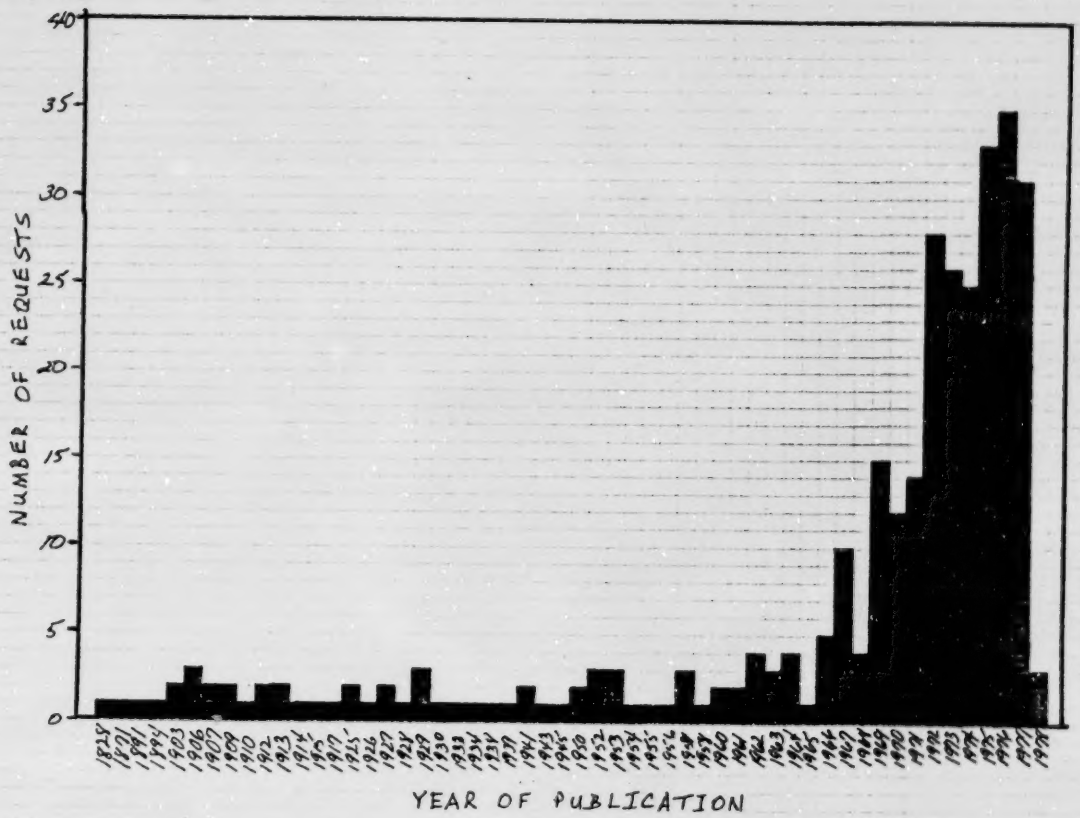


Figure 4. Distribution of Requests Among Periodicals For 1976. Number of Requests vs Number of Periodicals.

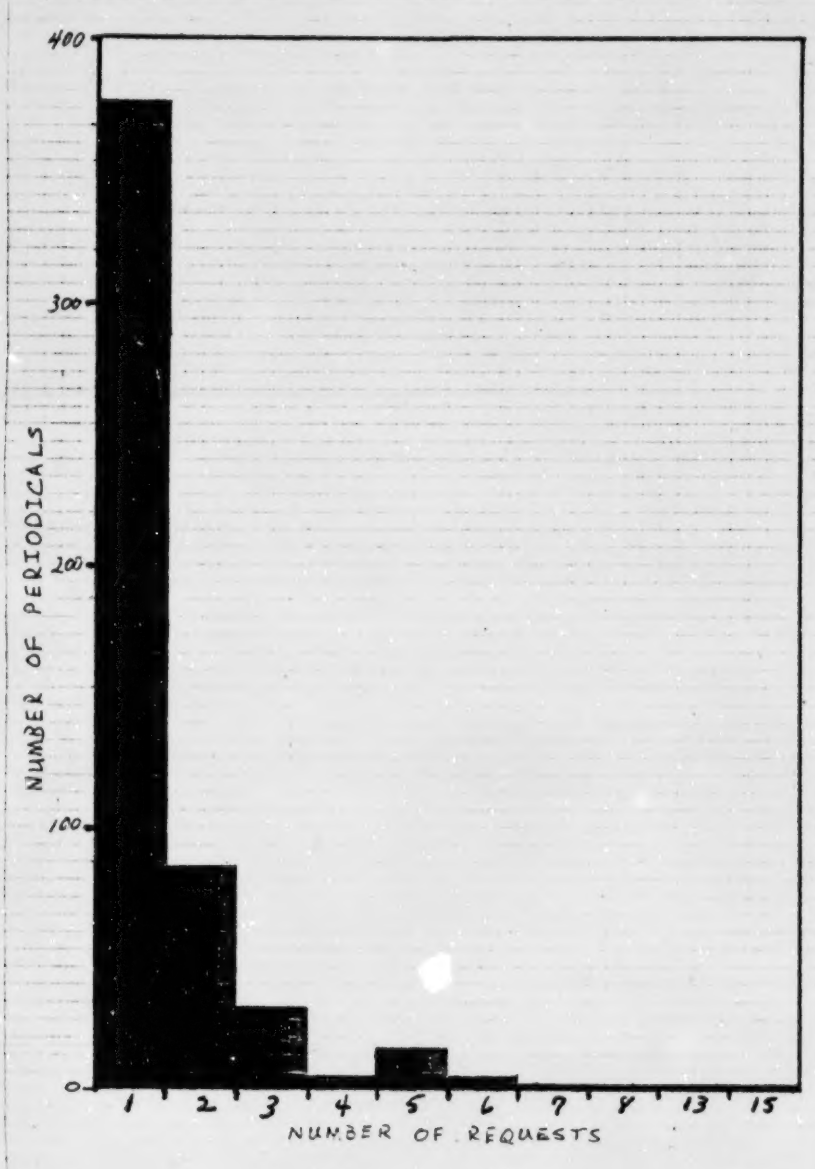


Figure 5. Distribution of Requests Among Periodicals For 1977. Number of Requests vs Number of Periodicals.

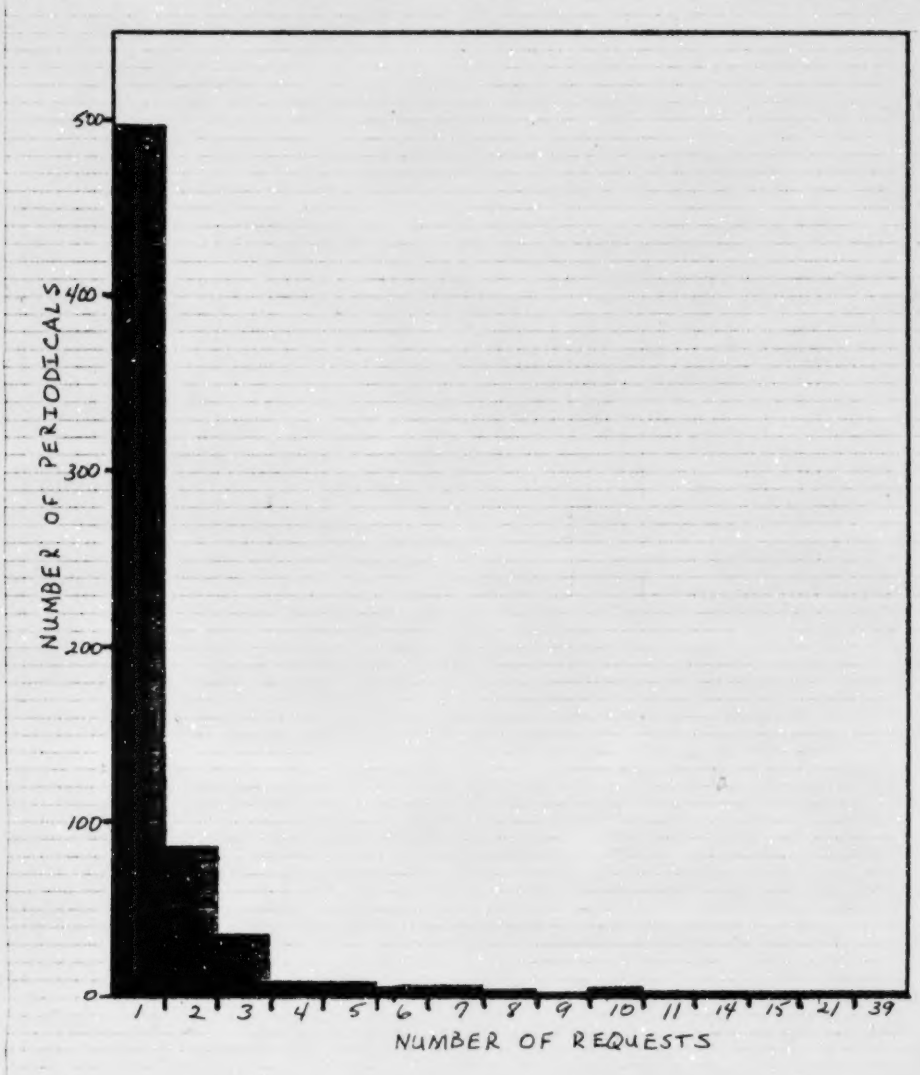


Figure 6. Distribution of Requests Among Periodicals For First Quarter of 1978.
Number of Requests vs Number of Periodicals.

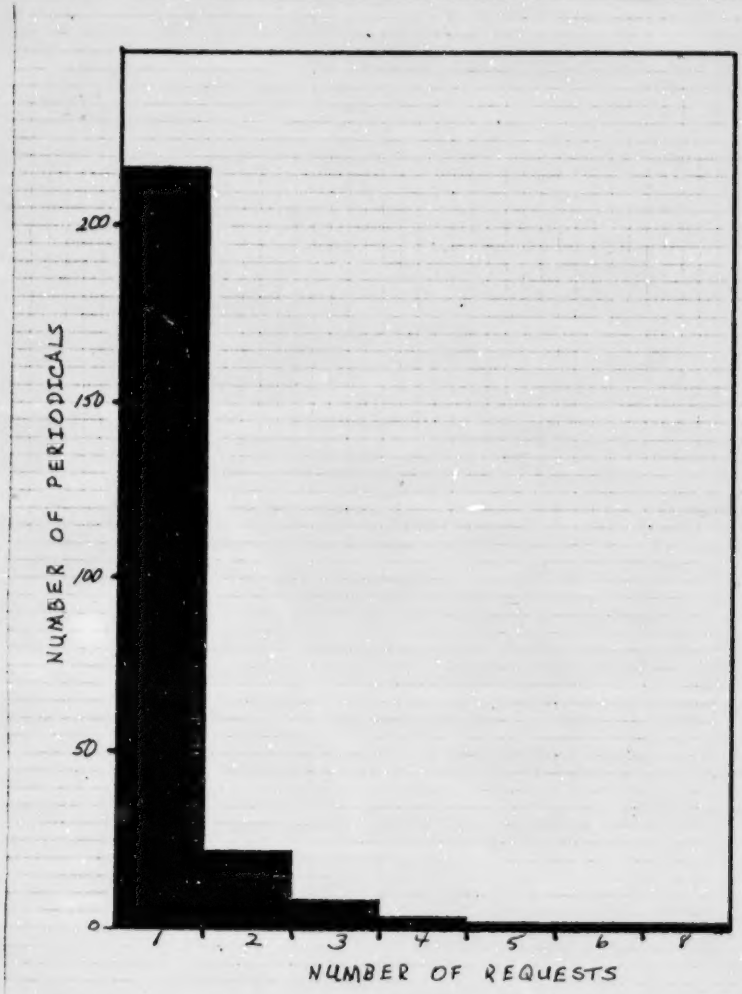
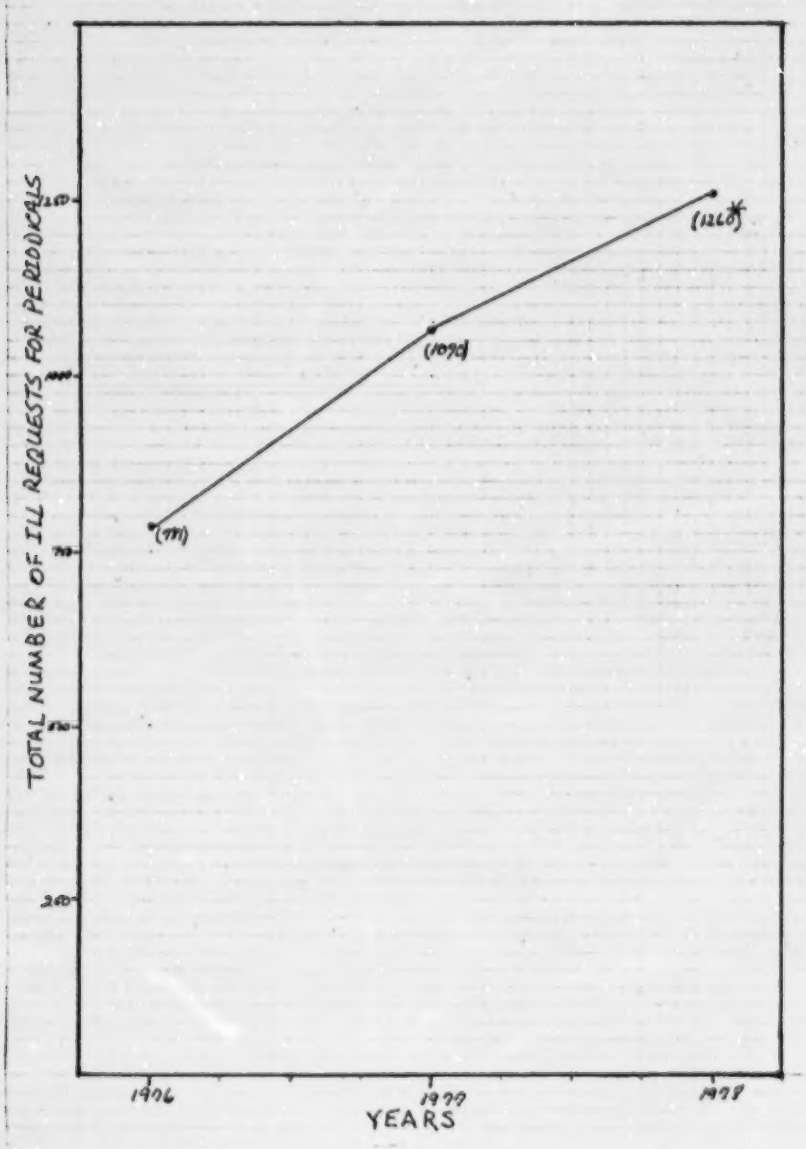


**Figure 7. Growth of Periodical Interlibrary Loan Activity Years vs Total Number of ILL Requests for Periodicals**




*Projected Total based on First Quarter Activity

Table 1. Distribution of Requests for 1976

| Year | No. Requests | Year | No. Requests |
|---|---|---|---|
| 1841 | 2 | 1943 | 2 |
| 1855 | 1 | 1944 | 2 |
| 1867 | 1 | 1945 | 2 |
| 1890 | 1 | 1947 | 1 |
| 1894 | 1 | 1948 | 2 |
| 1895 | 1 | 1949 | 5 |
| 1896 | 2 | 1950 | 1 |
| 1897 | 1 | 1951 | 3 |
| 1898 | 1 | 1952 | 2 |
| 1901 | 1 | 1953 | 5 |
| 1908 | 1 | 1954 | 5 |
| 1909 | 1 | 1955 | 6 |
| 1911 | 1 | 1956 | 8 |
| 1912 | 2 | 1957 | 4 |
| 1918 | 2 | 1958 | 9 |
| 1919 | 1 | 1959 | 4 |
| 1920 | 4 | 1960 | 12 |
| 1922 | 1 | 1961 | 10 |
| 1923 | 2 | 1962 | 12 |
| 1925 | 1 | 1963 | 12 |
| 1926 | 2 | 1964 | 14 |
| 1927 | 1 | 1965 | 16 |
| 1928 | 4 | 1966 | 17 |
| 1929 | 2 | 1967 | 24 |
| 1930 | 2 | 1968 | 32 |
| 1932 | 5 | 1969 | 35 |
| 1933 | 1 | 1970 | 38 |
| 1935 | 2 | 1971 | 29 |
| 1936 | 4 | 1972 | 51 |
| 1937 | 1 | 1973 | 86 |
| 1938 | 3 | 1974 | 95 |
| 1939 | 1 | 1975 | 110 |
| 1940 | 3 | 1976 | 53 |
| 1941 | 1 | Unknown | 10 |
| 1942 | 4 | | |
| | | Total Requests | 781 |

Table 2. Distribution of Requests Among Periodicals for 1976

| Number of Requests | Number of Periodicals |
|---|---|
| 1 | 375 |
| 2 | 83 |
| 3 | 31 |
| 4 | 4 |
| 5 | 13 |
| 6 | 4 |
| 7 | 1 |
| 8 | 1 |
| 13 | 1 |
| 15 | 1 |

Total Number of Periodicals 514

Table 3. Distribution of Requests for 1977

| Year | No. Requests | Year | No. Requests |
|---|---|---|---|
| 1704 | 1 | 1930 | 2 |
| 1708 | 1 | 1931 | 2 |
| 1836 | 1 | 1932 | 4 |
| 1837 | 1 | 1933 | 4 |
| 1849 | 2 | 1934 | 3 |
| 1856 | 1 | 1935 | 7 |
| 1867 | 2 | 1936 | 5 |
| 1868 | 1 | 1937 | 2 |
| 1870 | 1 | 1938 | 2 |
| 1877 | 2 | 1939 | 4 |
| 1882 | 1 | 1940 | 1 |
| 1884 | 1 | 1942 | 1 |
| 1885 | 1 | 1944 | 1 |
| 1888 | 1 | 1945 | 4 |
| 1889 | 1 | 1946 | 4 |
| 1890 | 1 | 1947 | 10 |
| 1893 | 1 | 1948 | 5 |
| 1894 | 1 | 1949 | 7 |
| 1895 | 2 | 1950 | 6 |
| 1896 | 1 | 1951 | 13 |
| 1900 | 1 | 1952 | 14 |
| 1901 | 1 | 1953 | 4 |
| 1903 | 2 | 1954 | 6 |
| 1904 | 1 | 1955 | 6 |
| 1905 | 1 | 1957 | 8 |
| 1906 | 2 | 1958 | 13 |
| 1909 | 1 | 1959 | 14 |
| 1910 | 1 | 1960 | 14 |
| 1911 | 1 | 1961 | 11 |
| 1912 | 1 | 1962 | 21 |
| 1913 | 1 | 1963 | 20 |
| 1914 | 2 | 1964 | 18 |
| 1915 | 3 | 1965 | 22 |
| 1916 | 3 | 1966 | 25 |
| 1917 | 1 | 1967 | 40 |
| 1918 | 1 | 1968 | 52 |
| 1919 | 1 | 1969 | 48 |
| 1920 | 4 | 1970 | 39 |
| 1921 | 2 | 1971 | 46 |
| 1922 | 3 | 1972 | 57 |
| 1923 | 4 | 1973 | 72 |
| 1924 | 3 | 1974 | 65 |
| 1925 | 4 | 1975 | 103 |
| 1926 | 6 | 1976 | 118 |
| 1927 | 2 | 1977 | 43 |
| 1928 | 1 | Unknown | 15 |
| 1929 | 5 | | |

Total Requests 1070

Table 4. Distribution of Requests Among Periodicals For 1977

| Number of Requests | Number of Periodicals |
|---|---|
| 1 | 497 |
| 2 | 85 |
| 3 | 34 |
| 4 | 9 |
| 5 | 9 |
| 6 | 4 |
| 7 | 4 |
| 8 | 3 |
| 9 | 1 |
| 10 | 3 |
| 11 | 1 |
| 14 | 1 |
| 15 | 1 |
| 21 | 1 |
| 39 | 1 |
| Total Number of Periodicals | 654 |

Table 5. Distribution of Requests for First Quarter of 1978

| Year | No. Requests | Year | No. Requests |
|---|---|---|---|
| 1828 | 1 | 1952 | 3 |
| 1871 | 1 | 1953 | 3 |
| 1891 | 1 | 1954 | 1 |
| 1894 | 1 | 1955 | 1 |
| 1903 | 2 | 1956 | 1 |
| 1906 | 3 | 1957 | 3 |
| 1907 | 2 | 1958 | 1 |
| 1909 | 2 | 1960 | 2 |
| 1910 | 1 | 1961 | 2 |
| 1912 | 2 | 1962 | 4 |
| 1913 | 2 | 1963 | 3 |
| 1914 | 1 | 1964 | 4 |
| 1915 | 1 | 1965 | 1 |
| 1917 | 1 | 1966 | 5 |
| 1925 | 2 | 1967 | 10 |
| 1926 | 1 | 1968 | 4 |
| 1927 | 2 | 1969 | 15 |
| 1928 | 1 | 1970 | 12 |
| 1929 | 3 | 1971 | 14 |
| 1930 | 1 | 1972 | 28 |
| 1933 | 1 | 1973 | 26 |
| 1934 | 1 | 1974 | 25 |
| 1938 | 1 | 1975 | 33 |
| 1939 | 1 | 1976 | 35 |
| 1941 | 2 | 1977 | 31 |
| 1943 | 1 | 1978 | 3 |
| 1945 | 1 | Unknown | 4 |
| 1950 | 2 | | |

Total Requests 315
Projected Total for Year 1260

Table 6. Distribution of Requests Among Periodicals For First Quarter of 1978

| Number of Requests | Number of Periodicals |
|---|---|
| 1 | 216 |
| 2 | 22 |
| 3 | 8 |
| 4 | 3 |
| 5 | 1 |
| 6 | 1 |
| 8 | 1 |
| Total Number of Periodicals | 252 |

Table 7. Percentage Distribution of Requests for 1976 through First Quarter 1978

Percent of Total Requests

| Year | % greater than 10 years old | % within 5 years | % within 10 years | % single requests | % 5 requests or less | average number requests/period |
|---|---|---|---|---|---|---|
| 1976 | 25.7% | 54.3% | 73.0% | 48.0% | 91.6% | 1.6 |
| 1977 | 36.2 | 42.8 | 63.8 | 46.5 | 79.4 | 1.7 |
| 1978 1st Qtr. | 27.0 | 48.6 | 71.8 | 68.6 | 95.6 | 1.3 |

Table 8. Periodicals with More than 5 Requests for 1976

Journal of Physical Chemistry

| | |
|---|---|
| 1960 | 1965 |
| 1961 | 1967 |
| 1962 | 1975 |

Royal Society of London Philasophical Transactions

| | |
|---|---|
| 1895 | 1928 |
| 1897 | 1975 |
| 1898 | Unknown |

Journal of Marine Research

| | |
|---|---|
| 1939 | 1966 |
| 1940 | 1967 |
| 1949 | 1970 |

Academie des Sciences Comptes Rundes

| | |
|---|---|
| 1841 | 1949 |
| 1841 | 1966 |
| 1941 | 1970 |

Fukauka Acta Medica

| | | |
|---|---|---|
| 1969 | 1969 | 1971 |
| 1969 | 1971 | |
| 1969 | 1971 | |

Nuclear Instruments and Methods

| | | |
|---|---|---|
| 1963 | 1964 | 1972 |
| 1963 | 1967 | 1975 |
| 1964 | 1968 | |

* 8 Geological Society of America Abstracts

| | | | | |
|---|---|---|---|---|
| 1972 | 1973 | 1973 | 1973 | 1973 |
| 1973 | 1973 | 1973 | 1973 | |
| 1973 | 1973 | 1973 | 1973 | |

Meteorological Society of Japan, Journal

| | | | | |
|---|---|---|---|---|
| 1959 | 1965 | 1968 | 1967 | 1969 |
| 1962 | 1961 | 1968 | 1968 | 1968 |
| 1964 | 1967 | 1967 | 1968 | 1968 |

Table 9. Periodicals with More than 5 Requests for 1977

Technical Association of the Paper and Pulp Industry

| | | |
|---|---|---|
| 1973 | 1962 | 1962 |
| 1970 | 1955 | |
| 1968 | 1952 | |

Nuclear Instruments and Methods

| | | |
|---|---|---|
| 1977 | 1971 | 1965 |
| 1977 | 1976 | |
| 1977 | 1971 | |

National Academy of Science, Proceedings

| | | |
|---|---|---|
| 1919 | 1922 | 1939 |
| 1920 | 1923 | |
| 1920 | 1930 | |

Journal of Marine Research

| | | |
|---|---|---|
| 1940 | 1952 | 1966 |
| 1942 | 1954 | 1969 |
| 1970 | 1962 | |

* 3 Journal of Chromatography

| | | |
|---|---|---|
| 1972 | 1974 | 1976 |
| 1973 | 1975 | 1977 |
| 1973 | 1976 | |

Machine Design

| | | |
|---|---|---|
| 1960 | 1960 | 1963 |
| 1970 | 1960 | 1966 |
| 1960 | 1963 | |

Journal of Chromatographic Science

| | |
|---|---|
| 1970 | 1973 |
| 1973 | 1973 |
| 1973 | 1976 |

Journal of Audio Engineering Society

| | |
|---|---|
| 1961 | 1973 |
| 1975 | 1971 |
| 1976 | 1971 |

Table 9. (continued)

Meteorologische Rundschau

| | |
|---|---|
| 1974 | 1953 |
| 1964 | 1951 |
| 1954 | 1951 |

RAAG Memoirs of the Unifying Study of Basic Problems in Engineering and Physical Science

| | |
|---|---|
| 1962 | 1962 |
| 1962 | 1962 |
| 1968 | 1968 |

British Welding Journal

| | | |
|---|---|---|
| 1967 | 1965 | 1967 |
| 1968 | 1967 | |
| 1959 | 1967 | |

Journal of Physical Chemistry

| | | | | |
|---|---|---|---|---|
| 1966 | 1968 | 1967 | 1967 | Unknown |
| 1958 | 1968 | 1967 | 1966 | |
| 1957 | 1968 | 1967 | 1966 | |

*2 International Journal of Mass Spectrometry

| | | | | |
|---|---|---|---|---|
| 1968 | 1970 | 1971 | 1975 | 1972 |
| 1969 | 1971 | 1974 | 1971 | 1973 |
| 1969 | 1971 | 1974 | 1972 | 1973 |

*5 Electrochemical Society Journal

| | | | | | |
|---|---|---|---|---|---|
| 1963 | 1974 | 1973 | 1974 | 1970 | 1971 |
| 1951 | 1973 | 1975 | 1975 | 1971 | |
| 1975 | 1974 | 1976 | 1972 | 1971 | |

Smithsonian Miscellaneous Collection

| | | | | | |
|---|---|---|---|---|---|
| 1947 | 1918 | 1927 | 1933 | 1935 | 1944 |
| 1949 | 1924 | 1931 | 1933 | 1935 | 1945 |
| 1951 | 1925 | 1932 | 1934 | 1936 | 1947 |
| 1916 | 1925 | 1932 | 1934 | 1937 | 1947 |
| 1916 | 1925 | 1932 | 1935 | 1939 | 1947 |
| 1947 | 1948 | 1948 | 1949 | 1952 | |

Table 9. (continued)

**Astrophysical Journal**

| | | |
|---|---|---|
| 1965 | 1906 | 1913 |
| 1903 | 1909 | 1913 |
| 1904 | 1911 | 1914 |

**Pulp and Paper Magazine of Canada**

| | | | |
|---|---|---|---|
| 1972 | 1951 | 1959 | 1967 |
| 1972 | 1955 | 1959 | |
| 1955 | 1962 | 1959 | |

**Welding Research Abroad**

| | | | |
|---|---|---|---|
| 1967 | 1969 | 1973 | 1971 |
| 1967 | 1972 | 1972 | |
| 1968 | 1972 | 1954 | |

**Annual Report of the Smithsonian**

| | | | |
|---|---|---|---|
| 1936 | 1920 | 1923 | 1932 |
| 1949 | 1921 | 1929 | |
| 1910 | 1922 | 1930 | |

**Royal Society Philasophical Transactions**

| | | | |
|---|---|---|---|
| 1915 | 1893 | 1884 | 1849 |
| 1708 | 1849 | 1877 | 1704 |
| 1895 | 1885 | 1868 | |

Table 10. Periodicals with More than 5 Requests for 1978

Economic Geology

| | | |
|---|---|---|
| 1972 | 1974 | 1973 |
| 1971 | 1975 | 1977 |
| 1971 | 1973 | |

Electrochemical Society Journal

| | |
|---|---|
| 1977 | 1975 |
| 1972 | 1977 |
| 1976 | 1975 |

Table 11. Periodicals Involving Violations

| Year | Periodical | No. of Violations |
|---|---|---|
| 1976 | Geological Society of America Abstracts | 8 |

Violation = 1.02% of Total Requests
Periodical = 0.2% of Requested Periodicals

| Year | Periodical | No. of Violations |
|---|---|---|
| 1977 | International Journal of Mass Spectrometry and Ion Physics | 2 |
| | Electrochemical Society Journal | 5 |
| | Journal of Chromatography | 3 |
| | Total | 10 |

Violations = 0.94% of Total Requests
Periodicals = 0.46% of Requested Periodicals

| Year | Periodical | No. of Violations |
|---|---|---|
| 1978 | None | None |

*No violations have occurred yet in 1978, but requests for articles in 2 periodicals have reached the limit of 5:

Economic Geology
Electrochemical Society Journal

Table 12. Periodicals for which Requests were Greater than 5

| Periodical | Years 1976 | 1977 | 1978 |
|---|---|---|---|
| Academie des Sciences Comptes Rundes | x | - | - |
| Annual Report of the Smithsonian | - | x | - |
| Astrophysical Journal | - | x | - |
| British Welding Journal | - | x | - |
| Economic Geology | - | - | x[L] |
| Electrochemical Society Journal | - | x* | x[L] |
| Fukauka Acta Medica | x | - | - |
| Geological Society of America Abstracts | x* | - | - |
| Internation Journal of Mass Spectrometry and Ion Physics | - | x* | - |
| Journal of Audio Engineering Society | - | x | - |
| Journal of Chromategraphic Science | - | x | - |
| Journal of Chromategraphy | - | x* | - |
| Journal of Marine Research | x | x | - |
| Journal of Physical Chemistry | x | x | - |
| Machine Design | - | x | - |
| Meteorological Society of Japan Journal | x | - | - |
| Meteorologische Rundschau | - | x | - |
| National Academy of Science Proceedings | - | x | - |
| Nuclear Instruments and Methods | x | x | - |
| Paper and Pulp Magazine of Canada | - | x | - |
| RAAG Memoirs of the Unifying Study of Basic Problems in Engineering and Physical Sciences | - | x | - |
| Royal Society of London Philasophical Transactions | x | x | - |
| Smithsonian Miscellaneous Collection | - | x | - |

Table 12. (continued)

| Periodical | Years 1976 | 1977 | 1978 |
|---|---|---|---|
| Technical Association of the Paper and Pulp Industry | - | x | - |
| Welding Research Abroad | - | x | - |

$x^*$ = violation occurred
$x^L$ = limit of 5 articles reached